	<b>MANUAL PROCEDURE OF ROTARY MICROTOME</b>		
	<b>Laboratory of Biology Structure and Function of Animal</b>		
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## I. Model and Spesification

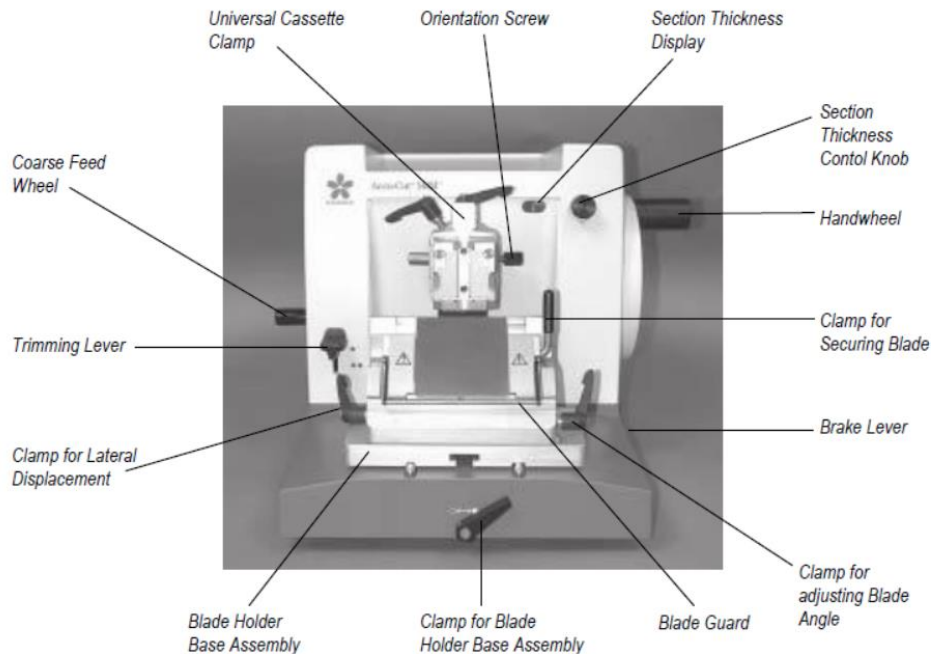
- a. Model : Accu Cut SRM 200 Rotary Microtome
- b. Section thickness range : 0.5 - 60  $\mu\text{m}$
- c. Section thickness selection : From 0 to 0.2  $\mu\text{m}$  in 0.5  $\mu\text{m}$   
From 2 to 10  $\mu\text{m}$  in 1  $\mu\text{m}$   
From 10 to 20  $\mu\text{m}$  in 2  $\mu\text{m}$   
From 20 to 60  $\mu\text{m}$  in 5  $\mu\text{m}$
- d. Coarse feed advance : Clockwise
- e. Horizontal specimen advance : 25 mm
- f. Vertical specimen stroke length : 59 mm
- g. Specimen retraction : 220  $\mu\text{m}$
- h. Clearance angle for blade holder : 0-10<sup>0</sup>
- i. Specimen orientation : Three-axis orientation  
Horizontal : 8<sup>0</sup>  
Vertical : 8<sup>0</sup>  
Rotation : 90<sup>0</sup>
- j. Micron thickness setting : Adjustable with visual display
- k. Trimming steps : 10  $\mu\text{m}$ , 50  $\mu\text{m}$
- l. Blade holder base  
North/South (vertically) : Maximum 55 mm with all adapter attached 40 mm  
East/West (horizontally) : 45 mm
- m. Operating temperature : +10<sup>0</sup>C to +40<sup>0</sup>C

## II. Application and Function

For the preparation of thin section of specimen (paraffin embedded specimen) for routine and research histology

### III. Basic Instrument and Overview

#### Basic Instrument - General view



### IV. Operating Instruction

- a. Inserting the specimen block into specimen clamp (universal cassette clamp) :
1. Pull the lever forward and mount the cassettes horizontally or vertically, and release the lever to secure the cassettes in position.

*Note: The universal cassette clamp is designed for horizontal or vertical clamping of all commercial cassettes.*

- b. Inserting disposable blades into blade holder assembly :
1. Verify that the blade holder base is locked in place.
  2. Repositioning the blade holder base as north-south orientation (vertical direction) or east-west orientation (horizontal direction).
  3. The north-south orientation is designed to bring blade holder as close as possible to the specimen for an optimal sectioning position. Please follow this steps :

- Turn the clamping lever at the front of microtome base plate, counter clockwise to release the clamping mechanism.
  - Move the blade holder base with attached blade holder forward or backward.
  - Turn the lever clockwise to tighten it.
4. East-west orientation is lateral displacement feature that permits using the entire length of cutting edge of the blade without having to release the blade clamping mechanism.
  5. To insert the blade, move the clamping lever down.
  6. Insert the blade carefully from the right side of blade holder.
  7. To clamp the blade, move the clamping lever up.
  8. Position the blade guard in the upright position to protect operator.
- c. Adjusting the clearance angle :
1. To release the clamping mechanism, rotate the lever counter clockwise.
  2. Adjust the blade holder so that the index line of the desired clearance angle coincides with the reference line on the blade holder base.
  3. Hold the blade holder in the desired position and rotate the lever clockwise to secure it.

*Note: The scale ( $0^{\circ}$ ,  $5^{\circ}$ ,  $10^{\circ}$ ) for the adjustment of the clearance angle is located on the right side of the blade holder.*

- d. Orienting the specimen :
1. The orienting clamp attachment facilitates three-axis specimen orientation without having release the specimen clamp.
  1. Rotate the handwheel to move the specimen to the uppermost position and lock the handwheel.
  2. Cover the blade with blade guard.
  3. Rotate the coarse feed wheel counter clockwise to move the specimen away from the blade edge to the maximum travelling position.
  4. To release the clamping mechanism, rotate the clamp counter clockwise.
  5. Use adjusting screw to orient the specimen in the vertical direction, and adjusting screw to orient in the horizontal direction.
  6. To secure the specimen in the adjusted position rotate the clamp clockwise
  7. Release the clamping lever at the front of microtome base and move the blade holder base assembly to a position close to the specimen.

*Note: Never orient a specimen during the retraction phase as the specimen will advance by the retraction value plus the selected section thickness.*

- e. Specimen trimming with the coarse feed wheel : The coarse feed wheel is positioned on the left side of the instrument.
1. Unlock the hand wheel.
  2. Rotate the coarse feed wheel in clockwise direction to gradually bring the specimen closer to the blade while simultaneously rotating, not rocking, the sectioning hand wheel. Keep trimming until you reach the desired area of the specimen where you wish to begin sectioning.
  3. Release the trimming lever before the handle of the handwheel reaches the 9 o'clock position during its clockwise rotation.

*Note: "Rocking" the handwheel is not recommended.*

- f. Sectioning : 1. Select the desired section thickness with the thickness adjustment knob or check the indicator to see if it suits your purposes.
2. To section, rotate the handwheel clockwise

*Note: The selected thickness appears in the selected thickness indicator. With each rotation of the handwheel, the specimen will advance the selected micron setting.*

- g. End of day protocol : 1. Rotate the handwheel to bring the specimen to the uppermost position and lock the handwheel.
2. Remove the blade from the holder and dispose of it properly.
  3. Remove specimen from the specimen clamp.
  4. Pick up any section waste with a dry brush.
  5. Clean the instrument with slightly moistened cloth.

## V. Trouble Shooting and Remedies

Problems	Possible cause	Remedy
Thick/thin section This section thickness varies from one section to another, in extreme case sections are skipped and a section is not obtained	<ul style="list-style-type: none"> <li>• Insufficient knife/blade inclination, consequently the clearance angle is too small</li> <li>• Insufficient clamping of specimen and/or blade</li> </ul>	<ul style="list-style-type: none"> <li>• Systematically try several clearance angle adjustments until the optimum angle is found</li> <li>• Check that all levers are locked and screws are tightened on the specimen and blade holder system. Retighten the levers and screws if necessary</li> </ul>

	<ul style="list-style-type: none"> <li>• Blunt knife/blade</li> </ul>	<ul style="list-style-type: none"> <li>• Use a different part of the cutting edge or use a new knife/blade</li> </ul>
<p>Compressed section The section are extremely compressed wrinkled or jammed together</p>	<ul style="list-style-type: none"> <li>• Blunt knife/blade</li> <li>• Specimen too warm</li> <li>• Clearance angle too big</li> <li>• Sectioning speed too fast</li> </ul>	<ul style="list-style-type: none"> <li>• Use a different part of the cutting edge or use a new knife/blade</li> <li>• Cool the specimen on a cold plate</li> <li>• Cool the specimen in iced water immediately before sectioning</li> <li>• Clearance angle adjustment, systematically decrease the clearance angle until the optimum adjustment is obtained</li> <li>• Rotate the hand wheel at the slower speed</li> </ul>
<p>The blade rings on the cutting stroke when sectioning hard specimen. Section show scratches and chatter marks</p>	<ul style="list-style-type: none"> <li>• Section speed too fast</li> <li>• Clearance angle too big</li> <li>• Insufficient clamping of specimen and/or blade</li> </ul>	<ul style="list-style-type: none"> <li>• Rotate the hand wheel at the slower speed</li> <li>• Clearance angle adjustment, systematically decrease the clearance angle until the optimum adjustment is obtained</li> <li>• Check that all levers are locked and screws are tightened on the specimen and blade holder system. Retighten the levers and screws if necessary</li> </ul>
<p>Specimen will not advanced, no section produced</p>	<ul style="list-style-type: none"> <li>• Specimen has reached the front feed limit</li> <li>• The coarse feed wheel cannot rotate freely</li> </ul>	<ul style="list-style-type: none"> <li>• Turn the coarse feed wheel in the appropriate direction to move the specimen toward the rear limit</li> <li>• Remove any obstruction</li> </ul>